

REMARKS

Claims 26-38 are pending in the present application. Claim 26 is amended above. No new matter is added by the claim amendment. Entry is respectfully requested.

Claims 26-38 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Elsawy, *et al.* (U.S. Patent No. 6,328,809 - hereinafter "Elsawy"). In view of the amendments to independent claim 26 and the following remarks, reconsideration and removal of the rejections, and allowance of the claims, are respectfully requested.

In the present invention as claimed in amended independent claim 26, a "first supply of drying fluid" is provided "at a first rate of supply," and a "second supply of drying fluid" is provided "at a second rate of supply." The "second rate of supply of the second supply of drying fluid" is "independent of the first rate of supply of the first supply of drying fluid." A "supply of decontaminating fluid" is stored in a "decontaminating fluid tank." The "decontaminating fluid tank" has an "inlet for receiving the second supply of drying fluid" and an "outlet for supplying a combination of the second supply of drying fluid and the decontaminating fluid at a rate that is based on the second controlled rate of supply of the second supply of drying fluid." The "first supply of drying fluid" and the "combination of the second supply of drying fluid and the decontaminating fluid" are simultaneously supplied to a "process chamber" to "decontaminate semiconductor wafers contained therein." A "first ratio of drying fluid to decontaminating fluid in the process chamber" is controlled by "controlling the first rate of supply of the first supply of drying fluid" and "independently controlling the second rate of supply of the second supply of drying fluid" so that the "first ratio of drying fluid to decontaminating fluid in the process chamber" is different than a "second ratio of drying fluid to decontaminating fluid in the combination of the second supply of the drying fluid and the decontaminating fluid at the outlet of the fluid tank," to "optimize the decontamination of the semiconductor wafers."

Independent claim 26 is amended herein to clarify that a method for processing semiconductor wafers comprises "controlling a first ratio of drying fluid to decontaminating fluid

in the process chamber by controlling the first rate of supply of the first supply of drying fluid and independently controlling the second rate of supply of the second supply of drying fluid so that the first ratio of drying fluid to decontaminating fluid in the process chamber is different than a second ratio of drying fluid to decontaminating fluid in the combination of the second supply of the drying fluid and the decontaminating fluid at the outlet of the fluid tank, to optimize the decontamination of the semiconductor wafers." With regard to statements made in the Office Action at page 4, section 2, it is submitted that the features upon which Applicants rely to overcome rejections based on the Elsawy reference are now recited in amended independent claim 26. Thus, for reasons described below, it is submitted that the present invention as claimed is not obvious in view of the Elsawy reference, since the present invention as claimed recognizes that the ratio of nitrogen gas to IPA gas in the process chamber is a critical factor during an IPA decontaminating step (see page 2, lines 12-14, and page 7, lines 7-10 of the present specification).

It is submitted that Elsawy fails to teach or suggest the present invention as claimed. In particular, Elsawy fails to teach or suggest "controlling a first ratio of drying fluid to decontaminating fluid in the process chamber by controlling the first rate of supply of the first supply of drying fluid and independently controlling the second rate of supply of the second supply of drying fluid so that the first ratio of drying fluid to decontaminating fluid in the process chamber is different than a second ratio of drying fluid to decontaminating fluid in the combination of the second supply of the drying fluid and the decontaminating fluid at the outlet of the fluid tank,...," as claimed in amended independent claim 26. Instead, Elsawy discloses a vapor drying method, wherein an IPA vapor is applied to a wafer W located in a vessel 12, and wherein the IPA vapor is carried from an IPA chamber 16 to the vessel 12 by a heated N2 gas supplied by an N2 source 54 (see Elsawy, FIG. 2, column 5, lines 38-40, and column 6, lines 57-62). The N2 source 54 of Elsawy is one of several sources of N2 gas in Elsawy that are applied at different times, and for different purposes, during the Elsawy process. In particular, Elsawy discloses the N2 source 54 that supplies N2 gas to the IPA chamber 16 via valve 56 to carry vapor from the chamber 16 into the vessel 12 (see Elsawy, FIG. 2 and column 6, lines

57-60). In addition, Elsawy discloses the N2 source 54 that supplies N2 gas to the vessel 12 via valve 58 to volatilize condensed IPA remaining on the wafer in a separate step (see Elsawy, FIG. 2 and column 5, lines 50-51). In addition, Elsawy discloses an N2 source 66 that introduces N2 gas into the vessel 12 via inlets 50 to purge the system of air in a separate step (see Elsawy, FIG. 2 and column 6, lines 34-37). While Elsawy discloses multiple N2 sources, i.e., N2 source 54 via valve 56, N2 source 54 via valve 58, and N2 source 66, none of the abovementioned N2 sources of Elsawy teaches or suggests applying the N2 sources so that a “first ratio of drying fluid to decontaminating fluid” in a “process chamber” that is “different than” a “second ratio of drying fluid to decontaminating fluid” in a “combination of the second supply of the drying fluid and the decontaminating fluid at the outlet” of a “fluid tank,” as claimed in claim 26 of the present invention. Specifically, there is no teaching or suggestion in Elsawy of a “first ratio” of N2 gas to IPA vapor in the vessel 12 being different than a “second ratio” of N2 gas to IPA vapor in the combination of N2 gas and IPA vapor at outlet valve 59 of IPA chamber 16.

Moreover, there is no mention in Elsawy of “controlling a first ratio of drying fluid to decontaminating fluid in the process chamber by controlling the first rate of supply of the first supply of drying fluid and independently controlling the second rate of supply of the second supply of drying fluid...,” as claimed in amended independent claim 26. Specifically, there is no teaching or suggestion in Elsawy of “controlling” a “first rate of supply” of N2 gas and “independently controlling” a “second rate of supply” of N2 gas to control a “first ratio” of N2 gas to IPA vapor in the vessel 12. Thus, assuming for the purpose of clarifying the distinctions between Elsawy and the present invention that the Elsawy N2 gas supplied by N2 source 54 via valve 56 is analogous to Applicants’ claimed “second rate of supply of the second supply of drying fluid,” there is no analog in Elsawy of a “first rate of supply of the first supply of drying fluid” that is independently controlled. Specifically, none of the remaining abovementioned N2 sources of Elsawy are analogous to Applicants’ claimed “first rate of supply of the first supply of drying fluid” that is controlled independently of a “second rate of supply of the second supply of drying fluid.”

In addition, it is submitted that Elsawy fails to teach or suggest “simultaneously supplying the first supply of drying fluid and the combination of the second supply of drying fluid and the decontaminating fluid to a process chamber to decontaminate semiconductor wafers contained therein,” as claimed in amended independent claim 26. With regard to statements made in the Office Action at pages 3-4, section 1, Applicants submit that these statements do not apply to the present invention, as claimed. Elsawy at column 5, lines 38-43 discloses two steps: an IPA step and a separate step of volatilizing condensed IPA remaining on the wafer after the IPA step. While the Office Action at page 4, lines 2-7 suggests that one skilled in the art would simultaneously perform these steps, the present invention does not disclose simultaneously supplying a decontaminating fluid and drying fluid. In the example of the present invention as illustrated at least at FIG. 3 and at FIG. 9, step 408, in a decontaminating step, a first supply of drying fluid (2<sup>nd</sup> N2) is simultaneously supplied with a combined second supply of drying fluid (1<sup>st</sup> N2) and IPA vapor to a process chamber 100. Subsequently, as illustrated at least at FIG. 9, step 410, a separate optional drying step can occur using a heated drying vapor (N2). In contrast, the two method steps of Elsawy are similar to a conventional method, for example, as disclosed in FIG. 1 and the Background of the Invention section of the present specification. In sum, the “first supply of drying fluid” as illustrated at FIG. 9, step 408 of the present specification is different than the drying vapor as illustrated at FIG. 9, step 410. The subsequent application of drying vapor as illustrated at FIG. 9, step 410, on the other hand, is similar to the application of heated N2 in the separate volatilizing step disclosed in Elsawy at column 5, lines 40-43.

Applicants further note that the Office Action at page 4, lines 1-2 states that “one skilled in the art would adjust the rate of supply to obtain optimum results.” Applicants submit that, even if the rate of supply of N2 gas supplied from N2 source of Elsawy is adjusted, as stated in the Office Action at page 4, lines 1-2, the adjusted rate of supply of N2 gas output from N2 source 54 via valve 56 would nevertheless fail to teach or suggest the present invention, as claimed, since there is no teaching or suggestion in Elsawy of “controlling the first rate of supply...” and “independently controlling the second rate of supply...,” as claimed. For at least these reasons, it follows that there is no teaching or suggestion in Elsawy of “simultaneously

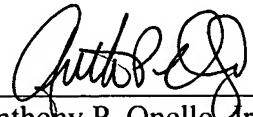
supplying the first supply of drying fluid and the combination of the second supply of drying fluid and the decontaminating fluid to a process chamber to decontaminate semiconductors contained therein," as claimed.

In view of the above, it is submitted that Elsawy fails to teach or suggest the present invention set forth in amended independent claim 26. Reconsideration and removal of the rejections of independent claim 26, and dependent claims 27-38 thereon, under 35 U.S.C. 103(a) based on Elsawy are respectfully requested.

Closing Remarks

It is submitted that all claims are in condition for allowance, and such allowance is respectfully requested. If prosecution of the application can be expedited by a telephone conference, the Examiner is invited to call the undersigned at the number given below.

Respectfully submitted,

  
\_\_\_\_\_  
Anthony P. Onello, Jr.  
Registration Number 38,572  
Attorney for Applicant

Date: April 12, 2006  
Mills & Onello, LLP  
Eleven Beacon Street, Suite 605  
Boston, MA 02108  
Telephone: (617) 994-4900, Ext. 4902  
Facsimile: (617) 742-7774  
J:\SAM\0526\AAF\amendmentaaaf.wpd